Nursery Stock Approved Treatment Program

Six Month Review

January 2009

This is a summary of the GWSS Nursery Stock Approved Treatment Program (ATP) for the period of June through December 2008. It is intended to give a comprehensive overview of the first six months of the program and assist with future program modifications. This report includes analysis or discussions of every element of the ATP including historical viewpoints, statistics, regulatory issues, monitoring activities, chemical evaluations, training and documentation. This document will also discuss adjustments made to the ATP during its first six months and mention future considerations.

Documentation

The Certificate of Quarantine Compliance (CQC), which ensures that the treatment application was witnessed by a licensed inspector of the origin county department of agriculture, is issued for each individual delivery of nursery stock. This document must be present at each destination delivery. Originally, the certificate expired on the third day after issuance. However, shipping nurseries requested to extend the duration of the CQC to five days. The CACASA/GWSS Working Group evaluated and approved the industry's recommendation. The CQC is now valid for five days from the date of issue.

The Blue tag, a shipping permit, must also be issued for each individual delivery within the nursery stock shipment. It is issued by the shipping nursery and requires the destination receiver to notify the destination county and hold the shipment for inspection.

The CQC and Blue tag are required to be faxed to the Pierce's Disease Control Program (PDCP) and each receiving county 24 hours in advance of the shipment leaving the origin nursery. If the counties agree and have the capabilities, the CQC and Blue tag can be scanned and sent by e-mail to the receiving counties. This gives each destination county advance notice of the shipment and allows them to schedule their inspection coverage.

Shipments

Following the approval of the ATP in March of 2008, five nurseries expressed interest to participate in the new program: Bordiers Nursery and Valley Crest Tree Company of Ventura County, Norman's Nursery and ABC Nursery of Los Angeles County, and Village Nurseries of Riverside County.

Bordiers Nursery and Valley Crest Tree Company began shipping under the ATP during the second week of June. They were followed by Norman's Nursery and Village Nurseries in early August. Los Angeles County began trapping ABC

Nursery in late November with anticipation of ATP shipments beginning in early 2009. The results below include all ATP shipments through December 31, 2008.

Nursery	# of Shipments	# of Plants
Bordiers Nursery	5	2,050
Valley Crest Tree Co.	67	1,484
Norman's Nursery	214	89,700
Village Nurseries	1,832	439,015
Total	**2,118**	**532,249**

A total of 35 counties have received shipments under the ATP.

Trapping

A trap cycle is defined as a trap servicing every two weeks. County trap records are forwarded to PDCP at the end of each trap cycle. The following table summarizes their findings:

Nursery	Date ATP	Acreage in Production	Number of Traps*	# of Traps > 10 GWSS
Nursery A	5/15/2008	150	688	7
Nursery B (Yard 1)	6/6/2008	290	1256	318**
Nursery B (Yard 2)	6/6/2008	111	469	1
Nursery C (Yard 1)	7/15/2008	20	88	7
Nursery C (Yard 2)	7/28/2008	126	619	8
Nursery D (Yard 1)	8/15/2008	25	110	1
Nursery D (Yard 2)	8/15/2008	27	122	0
Nursery D (Yard 3)	8/15/2008	1	7	0
Nursery D (Yard 4)	8/15/2008	6	31	0
Nursery D (Yard 5)	8/15/2008	10	40	0
Nursery D (Yard 6)	8/15/2008	2	12	0
Nursery D (Yard 7)	8/15/2008	8	34	2
Nursery D (Yard 8)	8/15/2008	9	41	0
Nursery D (Yard 9)	8/15/2008	7	71	0
Nursery D (Yard 10)	8/15/2008	14	59	0

* Includes yard traps and loading dock traps.
** 214 of the 318 positive traps were a result of a one-time spike on July 14, 2008.

Holds/Treatments

All nurseries are notified by county agricultural staff of traps containing more than 10 suspect GWSS on the day such traps are inspected. That area of the nursery is placed on hold immediately pending confirmation of the trapped suspect GWSS by CDFA or a county entomologist. All treatment applications in the field for trap areas on hold are supervised by county staff. At times, nurseries will wait two or three trap cycles before treating as they are aware of citrus harvesting or

other activities that will lead to re-infestation prior to the two trap cycle requirement. Once the GWSS pressure is reduced, a chemical treatment is applied and areas are released from hold after two subsequent trap cycles that show findings beneath the 10 GWSS threshold.

Treatment Monitoring/Improvement

All nursery stock being shipped under this program must be treated with either Sevin SL or Tame. Each treatment must be witnessed by a licensed county inspector throughout the entire process from the mixing/loading to the spraying of the very last plant. An inspector will issue the signed CQC with the treatment information, attesting that he/she witnessed the treatment.

Origin counties and nurseries have been working together to ensure treatments achieve adequate coverage of plant material destined to non-infested areas. Application methods may vary slightly for each location and combination of plants. The nursery industry has explored the use of treatment wands and pressurized hand guns to produce optimal spray coverage for a myriad of plant material situations.

Water sensitive paper (wsp) is used randomly in this program to evaluate spray coverage during application. Sheets of wsp are placed strategically within the nursery stock shipment at various heights and then checked after treatment. At the beginning of the program, wsp was used for each nursery's initial treatment. It is now used by the nurseries, on a random basis, as a quality control check. Each participating county department of agriculture also uses wsp as a check on treatment coverage. This is done on an unannounced random basis. PDCP staff also checks each participating nursery using wsp on a random basis a minimum of once a month.

PDCP staff will increase the frequency of the random testing during the spring shipping season. The frequency will be as follows:

Nurseries with less than 1 shipment/month: case by case basis
Nurseries with 5-25 shipments/week: twice/month
Nurseries with more than 25 shipments/week: once/week

PDCP is in the process of streamlining this practice by establishing guidelines for staff to ensure verifiable and equitable monitoring of all nurseries in the long term.

In conjunction with the increased use of wsp comes the possibility of increased pesticide exposure. Testing to establish a base line cholinesterase level for staff retrieving the wsp is being considered in accordance with requirements for working with Sevin, a carbamate insecticide.

Insect Rearing Sleeves

Monitoring

During training sessions, insect rearing sleeves were offered to any county agriculture department wanting to sleeve egg masses found in ATP shipments. Sleeves were distributed to the following counties: Alameda, Lake, Imperial, Monterey, Placer, Sacramento, San Joaquin, San Luis Obispo, Santa Clara, Santa Cruz, Solano, and Stanislaus.

Results

Two counties sleeved viable egg masses from ATP shipments. The results are as follows:

Date Collected	Origin Nursery	Destination County	Host & # of Egg Masses	Treatment	Fate	Date Released
7/17/2008	Nursery B	San Luis Obispo	*Arbutus* sp. (4) *Koelreuteria* sp. (2)	Sevin SL	Dead	7/28/2008
9/12/2008	Nursery C	Imperial	*Lagerstroemia* sp. (4)	Sevin SL	Dead	9/15/2008
9/18/2008	Nursery C	Imperial	*Ficus* sp. (2)	Sevin SL	Dead	9/22/2008, 9/25/2008

PDCP will continue to discuss the importance of sleeving with destination counties and encourage them to sleeve plant material where practical.

Pesticide Residue Sampling

Random pesticide residue sampling of plant material from ATP shipments has been implemented by two counties (Napa and Monterey). Sevin SL (carbaryl) is analyzed by high pressure liquid chromatography (HPLC) and Tame (fenpropathrin) is analyzed by gas chromatography (GC)**.** The current cost per sample at the CDFA Center for Analytical Chemistry is $400.00 with a turn around time of 15 days. Counties wishing to conduct residue sampling of ATP plant material can submit their samples to CDFA's Laboratory or to any of the Environmental Laboratory Accreditation Program (ELAP) laboratories found on the California Department of Public Health website at: http://www.cdph.ca.gov/CERTLIC/LABS/Pages/ELAP.aspx.

These tests are a presence/absence test for the product specified, since the minimum pesticide residue level needed to kill emerging GWSS nymphs is not yet known. The PDCP is exploring research options to identify target residue levels.

Both Napa and Monterey counties have submitted samples from Valley Crest Tree Company, Norman's Nursery, and Village Nurseries. Both counties are following handling procedures similar to pesticide enforcement samples, i.e.: Use

care to avoid contamination of the samples by wearing clean gloves, placing the samples in new paper bag(s), and refrigerating the samples as soon as possible before submitting them to the lab. Both counties are using Environmental Laboratory Accreditation Program (ELAP) laboratories.

The following are their results:

Napa County

Date Submitted	Chemical / Amount Detected
9/23/08	Sevin / 61.4 ppm
11/15/08	Sevin / 60.0 ppm

Monterey County

Date Submitted	Chemical / Amount Detected
9/12/2008	Sevin / 62.0 ppm
9/19/2008	Sevin / 13.38 ppm
9/26/2008	Sevin / 43.7 ppm
9/29/2008	Sevin / 23.0 ppm
10/10/2008	Sevin / 36.0 ppm
10/10/2008	Sevin / 116.0 ppm
10/17/2008	Sevin / 7.37 ppm
10/24/2008	Sevin / 259.4 ppm
10/31/2008	Sevin / 18.4 ppm
11/14/2008	Sevin / 53.0 ppm
11/18/2008	Sevin / 75.0 ppm
12/5/2008	Sevin / 57.0 ppm
12/5/2008	Sevin / 32.0 ppm
12/15/2008	Sevin / 26.34 ppm

The PDCP will encourage other counties to submit residue samples, if they are interested. The cost of analyzing the sample, however, cannot be invoiced against their existing contract.

Chemical Evaluation

Efforts are underway to identify additional materials that are efficacious against emerging nymphs. Two candidate materials are currently being used on the Asian Citrus Psyllid Project for citrus nursery stock. They are Spirotetramat and Spinetoram. A formal request for evaluation of these two products is being processed. In addition, a reevaluation of Deltamethrin and Acetamiprid, part of the original trial, will also be made. In previous chemical trials, both Deltamethrin and Acetamiprid showed a high efficacy rate against emerging nymphs but the trials revealed nymphs emerged from the egg case before death occurred. Further studies are necessary to determine complete efficacy data for

Deltamethrin and Acetamiprid. By comparison, Sevin SL and Tame effectively killed nymphs at occlusion preventing escape from their egg casing.

County Training

PDCP provides annual nursery inspection and regulatory training to county agriculture departments. In 2008, Approved Treatment Program training was added to the nursery presentation. Staff from 49 counties participated in the 2008 training sessions, some of which were held in conjunction with the Pest Exclusion Branch's Pest Prevention University. The training included a review of the GWSS Approved Treatment Nursery Pilot Program as well as an introduction to the ATP protocols and Best Management Practices (BMPs).

Immediately following the approval to move forward with the implementation of the Approved Treatment Program, a training session was scheduled with interested counties in the infested areas. PDCP representatives trained 22 county employees representing the six infested shipping counties. The training included nursery selection criteria, compliance agreements, enforcement matrix, best management practices, nursery management plans, and trapping criteria and reporting. County employees and representatives from all selected nurseries returned for a second training on April 10, 2008, to address protocol requirements, nursery management plans, employee training and quality control measures to ensure adequate coverage of plant material being shipped to non-infested areas. A treatment demonstration was given and various application techniques were discussed by Dr. John Kabishima. A total of 56 county and nursery personnel were in attendance. Nurseries participating in the ATP are required to train employees prior to participation in the program. A copy of employee training records is collected by PDCP prior to approval of any new ATP compliance agreement.

Trans-shipments / Blended Shipments

During the training session on March 13, 2008, the issue of plants being purchased by or transferred into ATP yards from infested nursery yards and then shipped to non-infested areas was raised. These plants would not be subject to the same requirements of the ATP protocol and could harbor excessive numbers of egg masses. To address this concern and avoid this becoming a loop hole in the program, the following statement was required in all ATP nursery GWSS Management Plans:

Incoming shipments of nursery stock will be from locations that have a current Compliance Agreement with the Glassy-winged Sharpshooter / Pierce's Disease Control Program. Additionally the following will apply:

- *From a Non-infested Premise or Approved-Treatment Nursery*
    - *Nursery stock will be accepted "as is"*
- *From an Infested Premise Nursery*

- *Nursery stock will be cleaned of all GWSS life stages by nursery staff prior to arrival*

  OR
- *The receiving nursery will establish a quarantine area for the incoming plants and the plants will be monitored using yellow sticky traps at a density of 2 traps per ½ acre for a period of no less than 4 weeks. The quarantine area will be a constant area approved by the County Agricultural Commissioner. ATP protocols will apply to any trap finds.*

Subsequently, the issue of blended shipments was raised, where ATP shipments from an infested nursery were being shipped north and combined with additional plants from a non-infested nursery within the infested area. After meeting with the nurseries in question, it was determined that the plants were clearly identifiable both on the invoicing and by plant type as the plants were unique in each location.

A second concern of blended shipments was the short duration of the CQC. After meetings with both the Ad Hoc Nursery Committee and CACASA/GWSS Working Group, it was agreed that the ATP CQC could be extended to five days.

County Workload Issues

Most destination counties have reported minimal changes to their workload since the implementation of the ATP. Counties are still visually inspecting these loads, so the workload differs very little from a typical infested premise nursery shipment. Destination inspection remains optional and PDCP anticipates that as the program evolves over time, workloads at destination will decrease.

Los Angeles and Riverside Counties are both saving money with this new program. Both counties are using fewer personnel than with the original infested premise nursery program.

County Concerns/Feedback

One issue was raised in July, 2008 regarding an ATP load that contained live aphids on an *Arbutus* tree. The shipment had been treated with Sevin SL. A total of six suspect viable GWSS egg masses were also found during inspection. Since there were live pests found on the plants, there was concern over whether there was adequate pesticide coverage. County staff removed long sections of the branches with the egg masses to observe them. All egg masses perished. Immediately upon the discovery of live pests in an ATP shipment, PDCP staff worked with the ATP nurseries to implement a new procedure for treating large trees. This new procedure has been placed into the BMPs. In addition, the PDCP staff consulted with the University of California at Riverside regarding the use of Sevin on aphids. It was discovered that Sevin is not highly efficacious against this pest. PDCP is following up with the University of California to investigate efficacy of approved materials on species other than GWSS.

In November, PDCP was alerted to the discovery of several old egg scars on plants in an ATP shipment. It was determined that the plants came from a portion of the nursery's yard that had just recently lifted a hold notice for trap counts exceeding the threshold of 10 per trap. It is reasonable to expect that old egg masses and egg scars will be present on these loads when holds due to pest pressure are lifted.

A call was received about rain preceding an ATP treatment. PDCP explained that any rain event occurring within 24 hours of a treatment would justify the revocation of an ATP CQC. The exception would be if the plants had been protected from the rain.

Changes to Protocol and BMP Manual

During the current shipping season, a few changes and additions were made to both the protocol and BMPs. These were made to address specific concerns or issues as they arise.

The first change addressed the pressure (psi) to use with spray guns, wands, and nozzles. On page 14 of the BMP manual, the fourth and fifth sentences were bulletized. The statement was added, "When factory recommendations do not specify the spray gun pressure (psi), it is the grower(s) and CAC(s) responsibility to determine the appropriate pressure by assessing spray coverage using water sensitive spray cards, spray dyes, or visual inspection." This sentence was also added to the protocol under 4d.

The second change addressed the treatment of hard-to-reach foliage. The following statement was also added to the BMPs, "Difficult to reach foliage, such as the tops of tall trees may require the trees to be laid on their side to ensure thorough coverage."

The third change addressed changing the duration of the CQC expiration period from three to five days under 5d of the protocol, as mentioned previously in this document.

All of the above changes are reflected on the PDCP's website at: http://www.cdfa.ca.gov/pdcp. In addition, a new tab has been created on the website to show the new CQC expiration table.

Future Considerations

Hold and Treatment Radius Reduction

- The PDCP is considering a hold and treatment radius reduction from 300' to 200'. This issue will be discussed after a full year of ATP data is available for review.

Trap Reduction

- After one complete year of monitoring trap data at a trap density of two per ½ acre, a modification of trap density should be applied to all yards that exhibit less than 10% of traps resulting in holds. The CAC should take into account the pressure exhibited is limited to perimeter pressure and consistent hot spots. Any trap with 10+ GWSS found should have two traps per ½ acre in the area within 300 feet of that trap.

Dye Investigation

- The use of fluorescent dyes, for indication of pesticide coverage, is being researched.

Protocol Change

- Add the statement "nurseries shall maintain a free-from loading dock" into the ATP Protocol.

Items to Remain Unchanged Until End of One Year Review Period

- Holds to occur at a threshold of more than 10 GWSS per trap. Traps physically maintained by CAC staff.

- During the initial year in the program, nurseries should be trapped at a rate of two traps per ½ acre, evenly spaced throughout the nursery.

- Continued monitoring and oversight by PDCP staff, including review of trapping data and random checks of treatments.

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